

# Is The Sky Is Falling?

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San Jose January 23-24, 2001



Taipei February 14-15, 2001

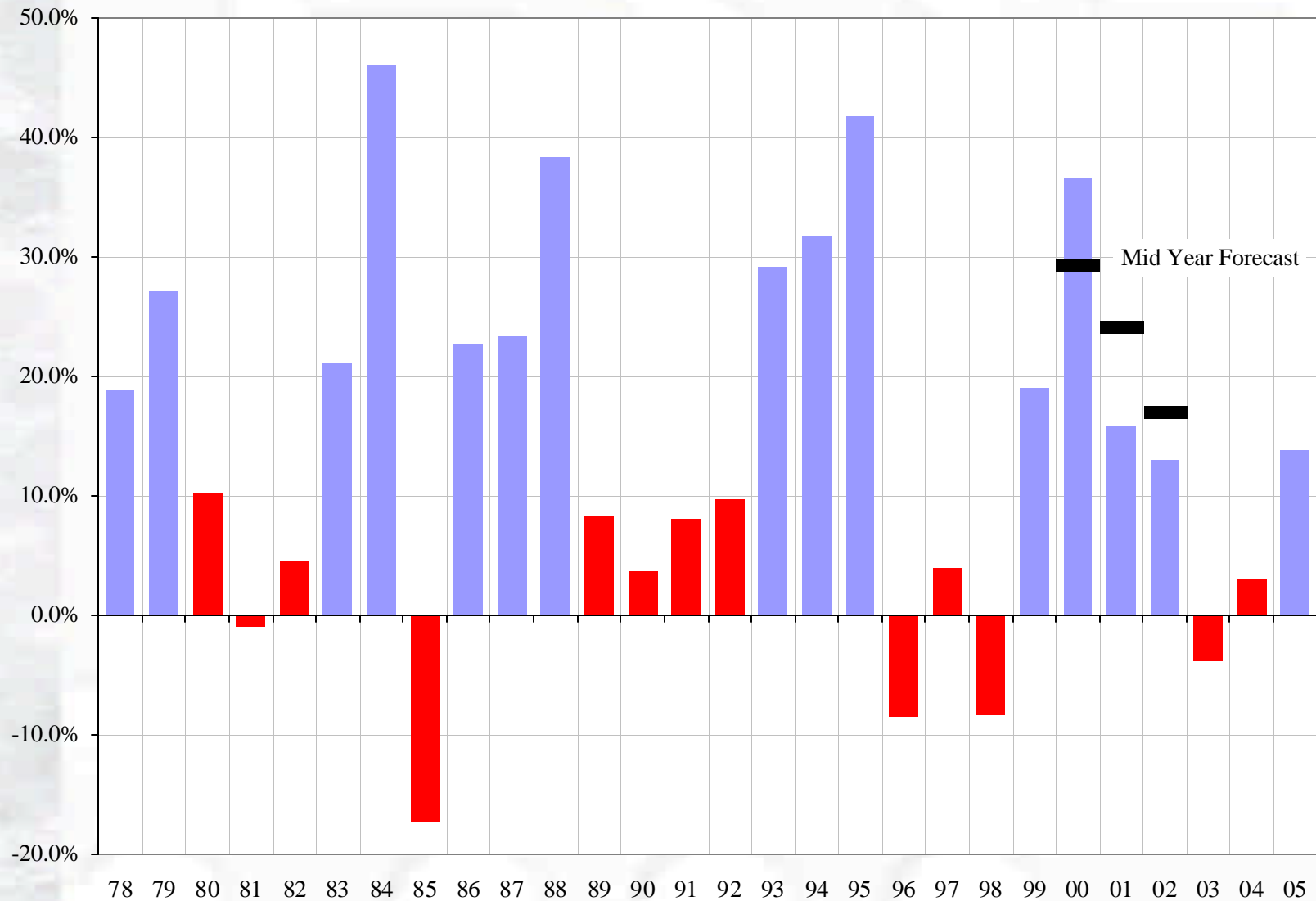
# 2001 Semiconductor Forecast

- ICE forecast of 15.8% growth is not mainstream
- Many Doom & Gloom Forecasts
- IC Capacity Utilization is at a high level
- Electronic Equipment markets are growing, albeit more slowly
- World economic conditions are mixed

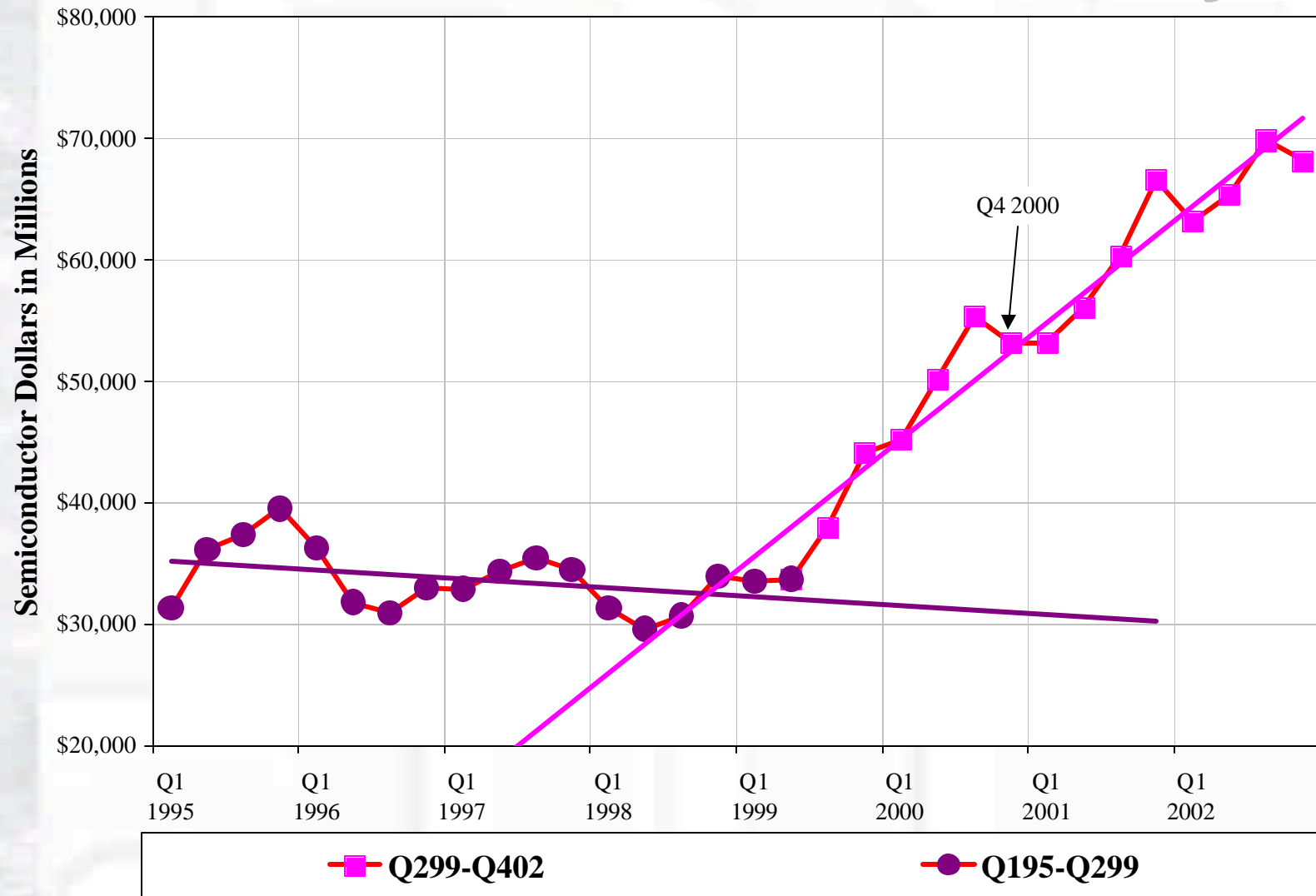
# Semi Market Cycles

- Since 1978 the semiconductor market has experienced several boom-bust cycles
- Most analysts agree on this point
- Exactly what constitutes a turning point is often a subject of debate
- Is 2001 to be the beginning of the next down cycle?
- What is down?

# Semiconductor Revenue Cycles



# The End of the Latest Down Cycle



# 2001 Semi Dollar Growth

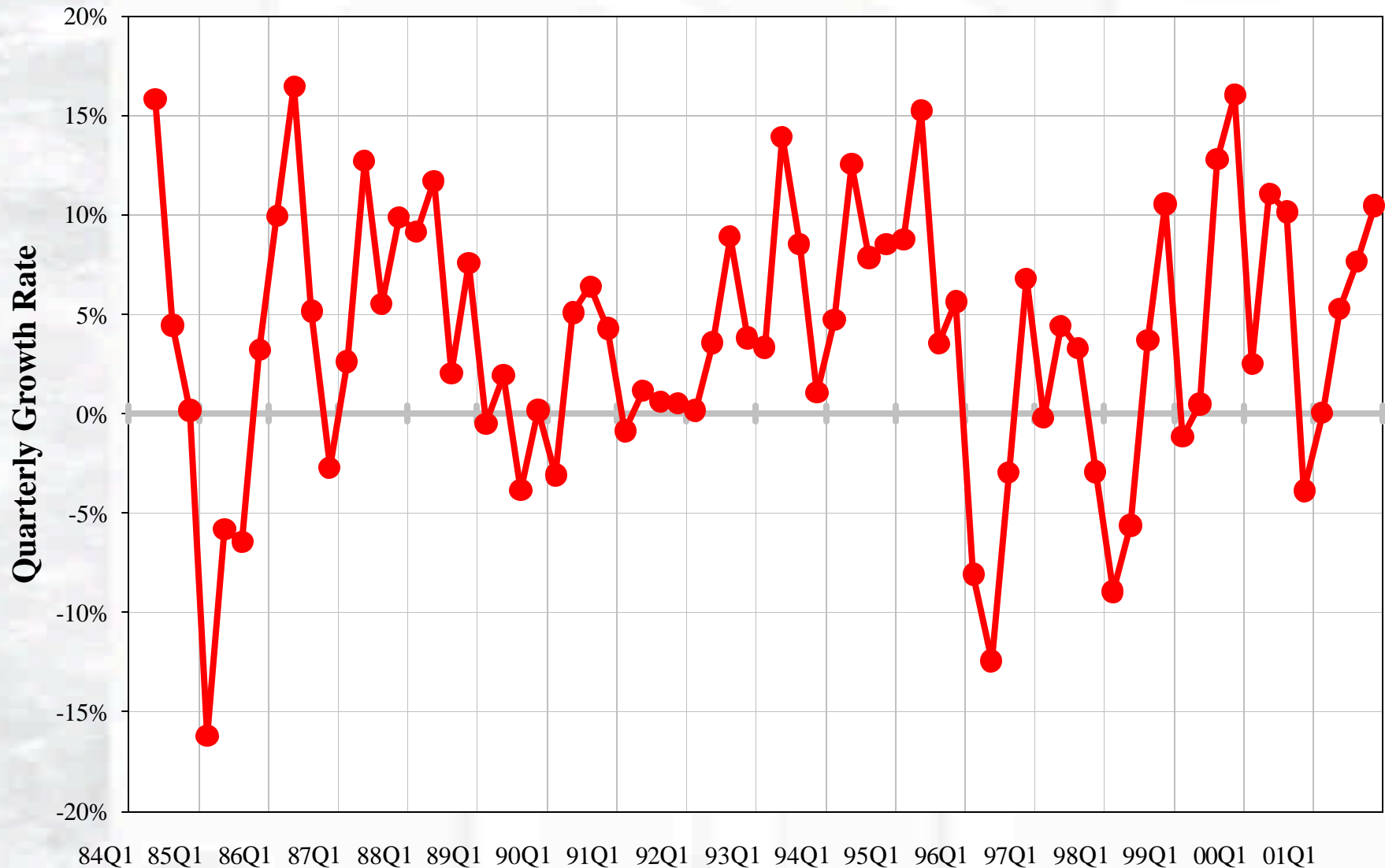
## Expert Opinions Vary Widely

Date	Firm	% Grow	Date	Firm	% Grow
09/05/00	In-Stat	23.5%	01/01/00	ICE	20.0%
05/17/99	Dataquest	21.2%	11/15/00	ICE	23.6%
10/09/00	Dataquest	27.5%	01/15/01	ICE	15.8%
10/31/00	Dataquest	21.0%	12/08/00	iSuppli	13.0%
11/14/00	Dataquest	27.0%	01/11/01	Motorola	10-15%
12/10/00	Dataquest	15-20%	01/08/01	Semico	18.0%
01/10/01	Dataquest	5-10%	06/01/00	SIA	25.3%
05/01/00	EIAJ	20.3%	11/01/00	SIA	21.8%
01/12/01	IC Insights	7.0%	12/10/00	VLSI Research	11.0%
	IC Insights	22.0%	01/10/01	VLSI Research	5.0%

# Fourth Quarter Performance a Sign of Doom?

Year	Q1	Q2	Q3	Q4	Year
1984		15.8%	4.4%	0.2%	46.0%
1985	-16.2%	-5.8%	-6.5%	3.2%	-17.2%
1986	9.9%	16.5%	5.2%	-2.7%	22.7%
1987	2.6%	12.7%	5.5%	9.9%	23.4%
1988	9.1%	11.7%	2.0%	7.6%	38.3%
1989	-0.5%	1.9%	-3.9%	0.2%	8.4%
1990	-3.1%	5.1%	6.4%	4.3%	3.6%
1991	-0.9%	1.2%	0.6%	0.5%	8.1%
1992	0.2%	3.6%	8.9%	3.8%	9.6%
1993	3.3%	13.9%	8.5%	1.1%	29.1%
1994	4.7%	12.6%	7.9%	8.5%	31.8%
1995	8.8%	15.2%	3.5%	5.6%	41.7%
1996	-8.1%	-12.4%	-2.9%	6.8%	-8.6%
1997	-0.2%	4.4%	3.3%	-2.9%	4.0%
1998	-8.9%	-5.6%	3.7%	10.5%	-8.4%
1999	-1.2%	0.5%	12.8%	16.0%	18.9%
2000	2.5%	11.1%	10.2%	-3.9%	36.6%
2001	0.0%	5.3%	7.7%	10.5%	15.8%

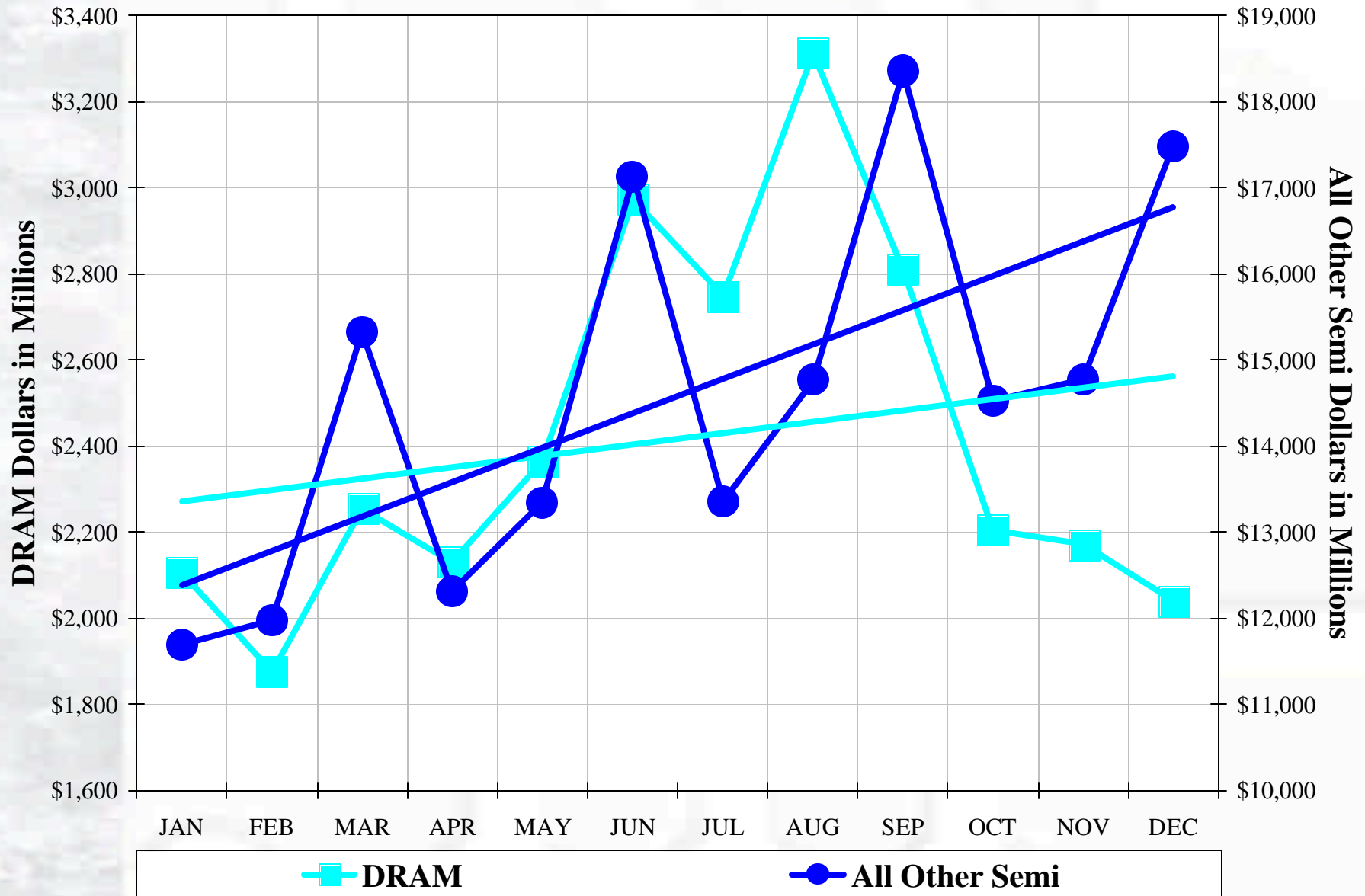
# Semiconductor Quarterly Dollar Shipment Growth Rates



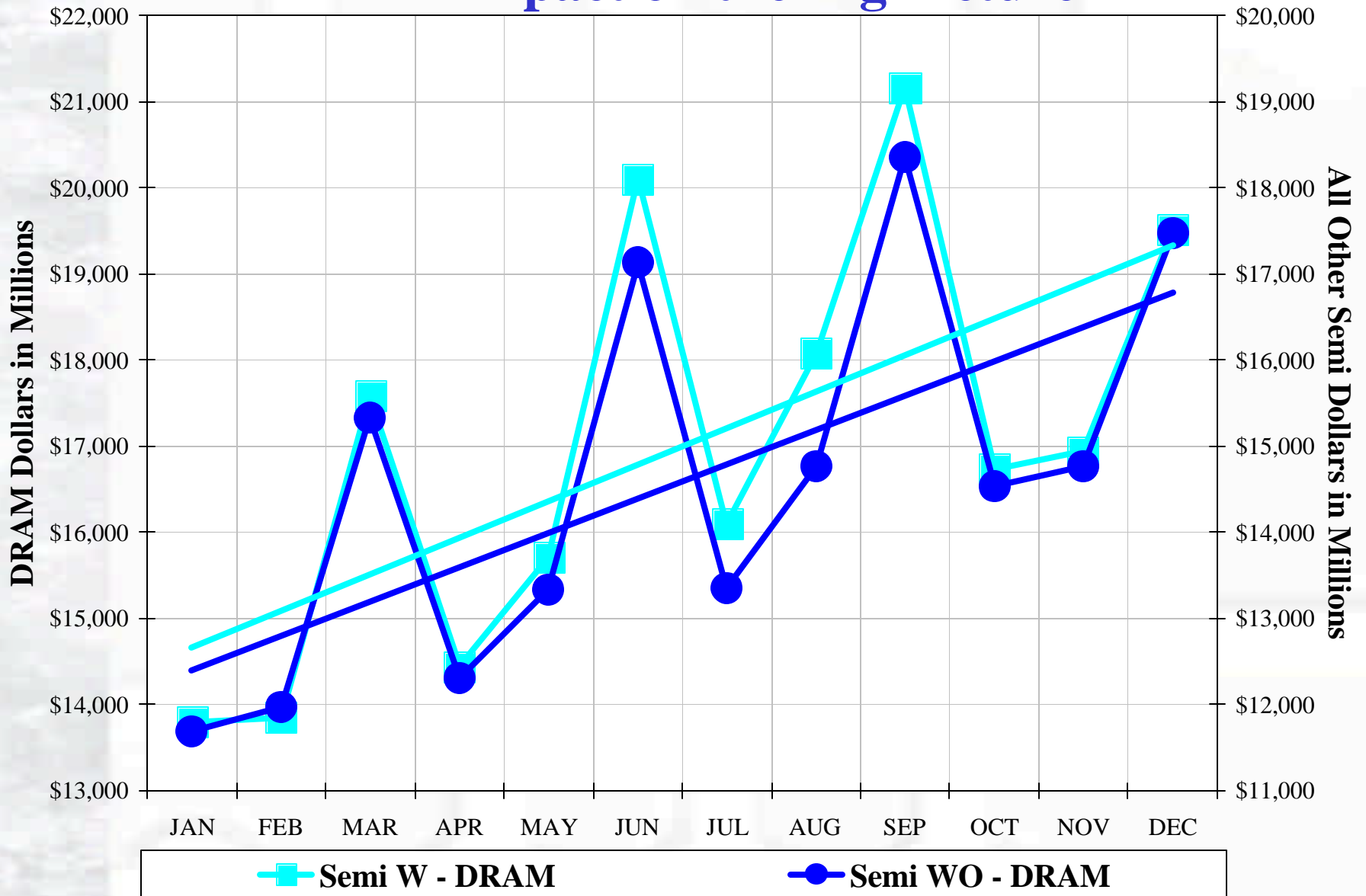
—●— Quarterly Semiconductor Dollar Shipment Growth rate



# DRAM Compared to All Other Semi Dollar Shipments



# DRAM Impact on the Big Picture



# DRAM 2000 - Always Interesting

- Unit shipments strong through August (a record 4 week month)
- AASP rises to \$9.46 in August from \$5.73 in Mar
- 64Mbit rises from under 10% of total units in Q4 1999 to over 20% in Q4 2000
- Unit shipments soften in September

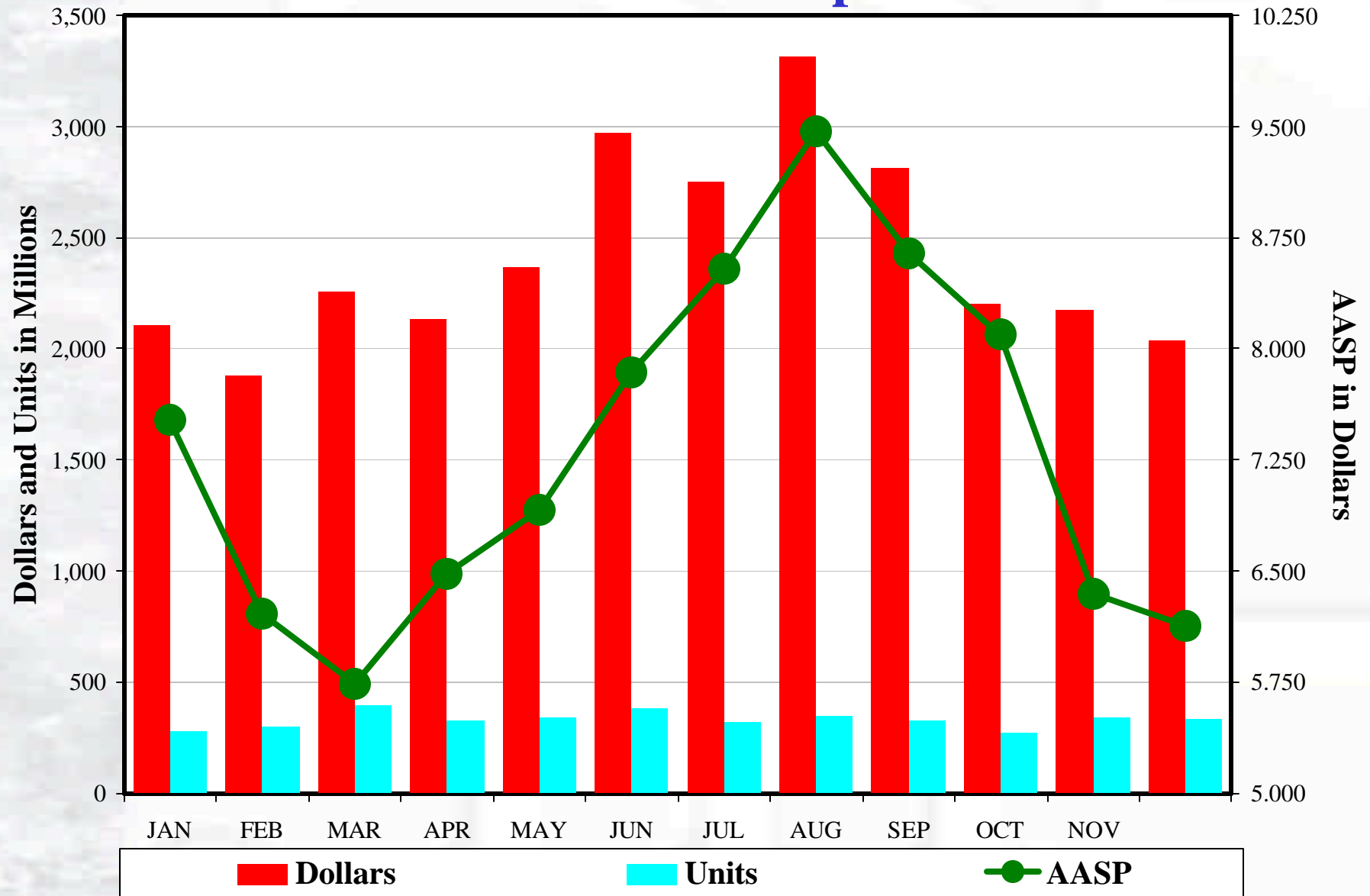
# 2000 DRAM Scenario

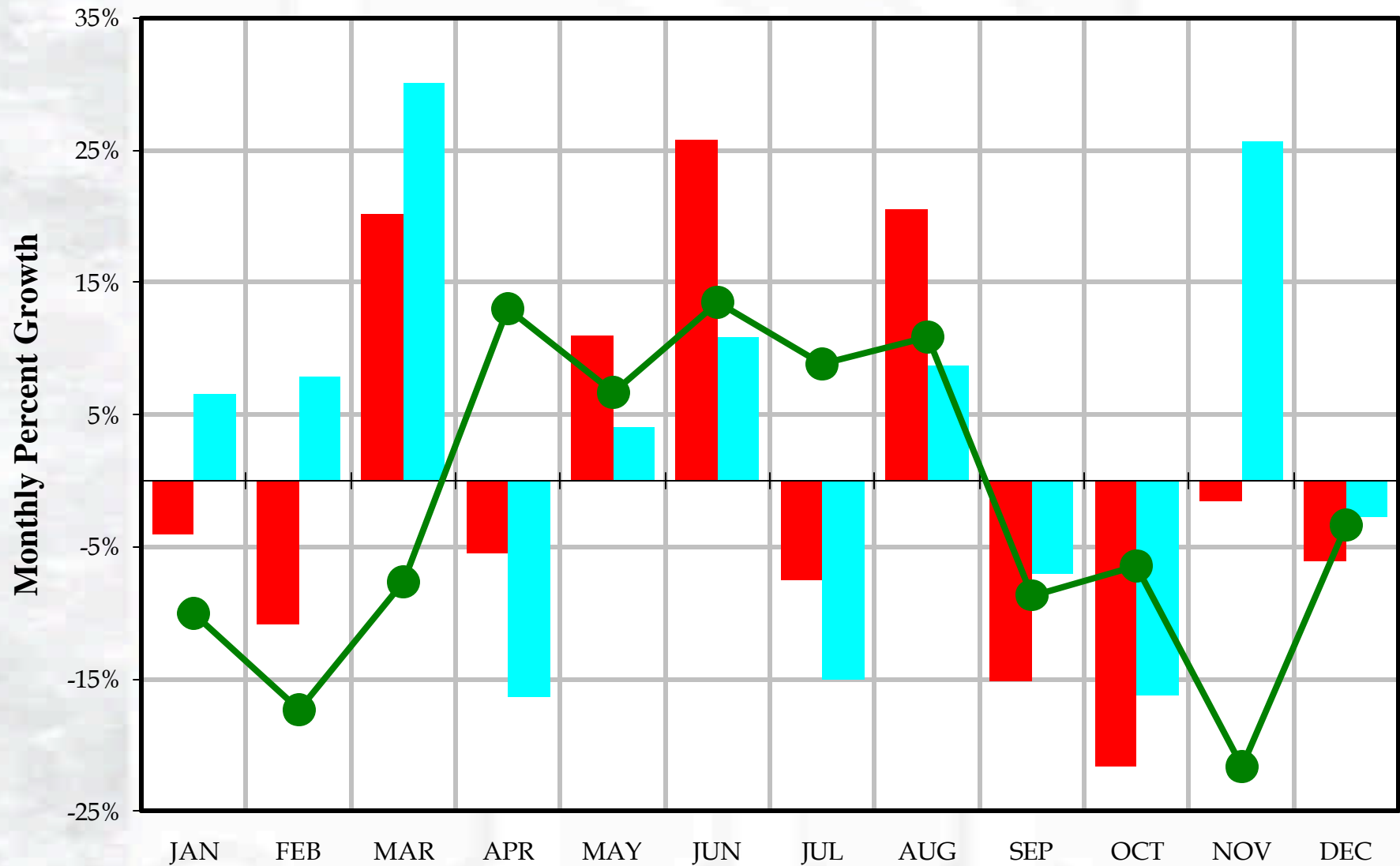
- Driven by fear of shortages users build safety stock
- DRAM capacity increased to meet order rate
- Fear of shortage evaporates
- Orders cut back to reduce user inventory
- DRAMs keep pouring off the line and build supplier inventory
- AASP drops to \$6.34 in Nov
- Users bump up orders and buy record volume

# 2001 DRAM Scenario

- During the 2000 perceived shortage PC DRAM content remained relatively flat
- Raising DRAM content might have limited PC unit shipments
- With fear abated PC makers can increase DRAM content
- Unit and dollar shipments will increase after the inventory of users is adjusted
- AASP will be lower in 2001 than 2000 by 7%

# DRAM 2000 Dollar & Unit Shipments with AASP



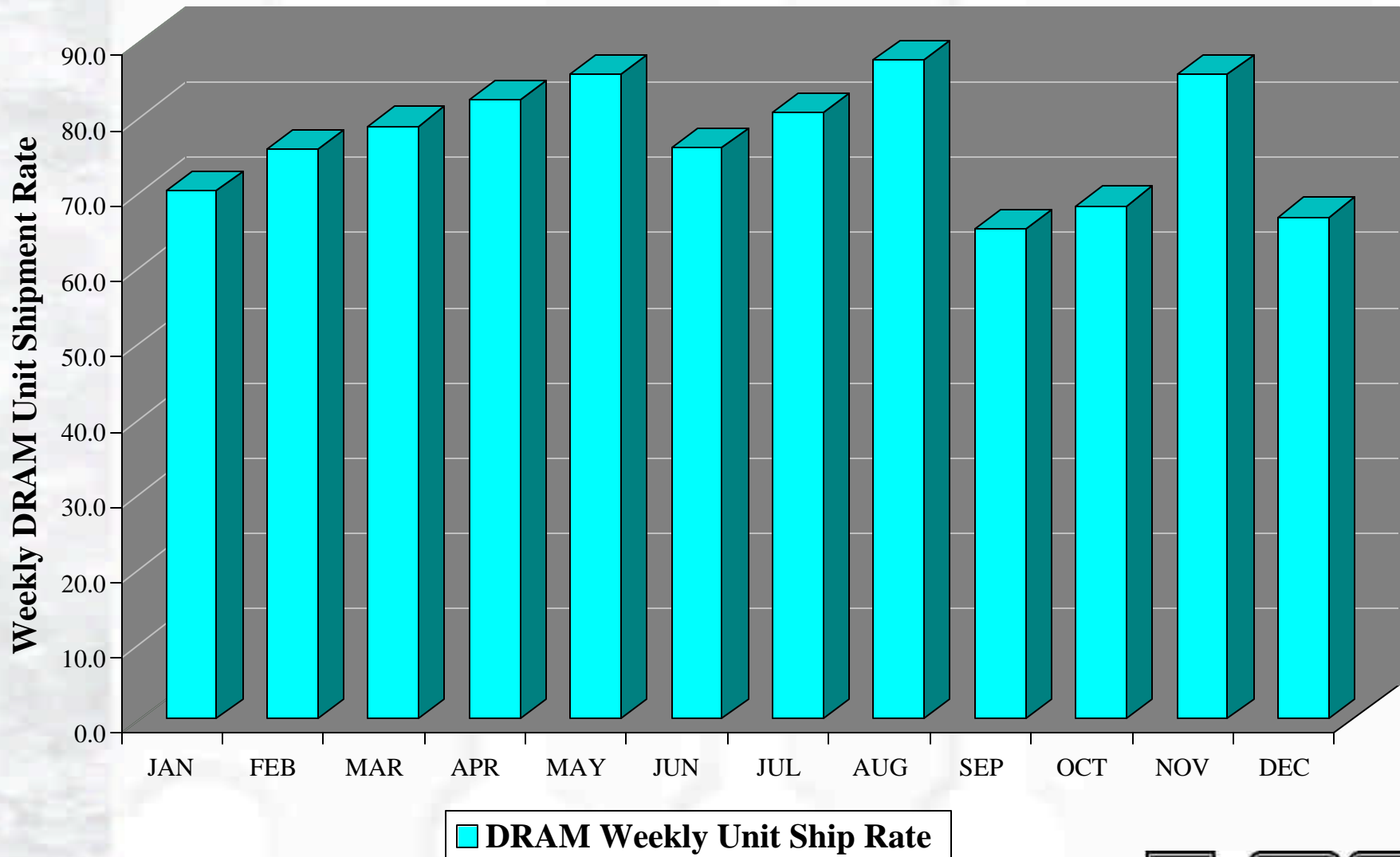


 Dollars

 Units

 AASP

# DRAM Weekly Unit Shipment Rate by Month in 2000





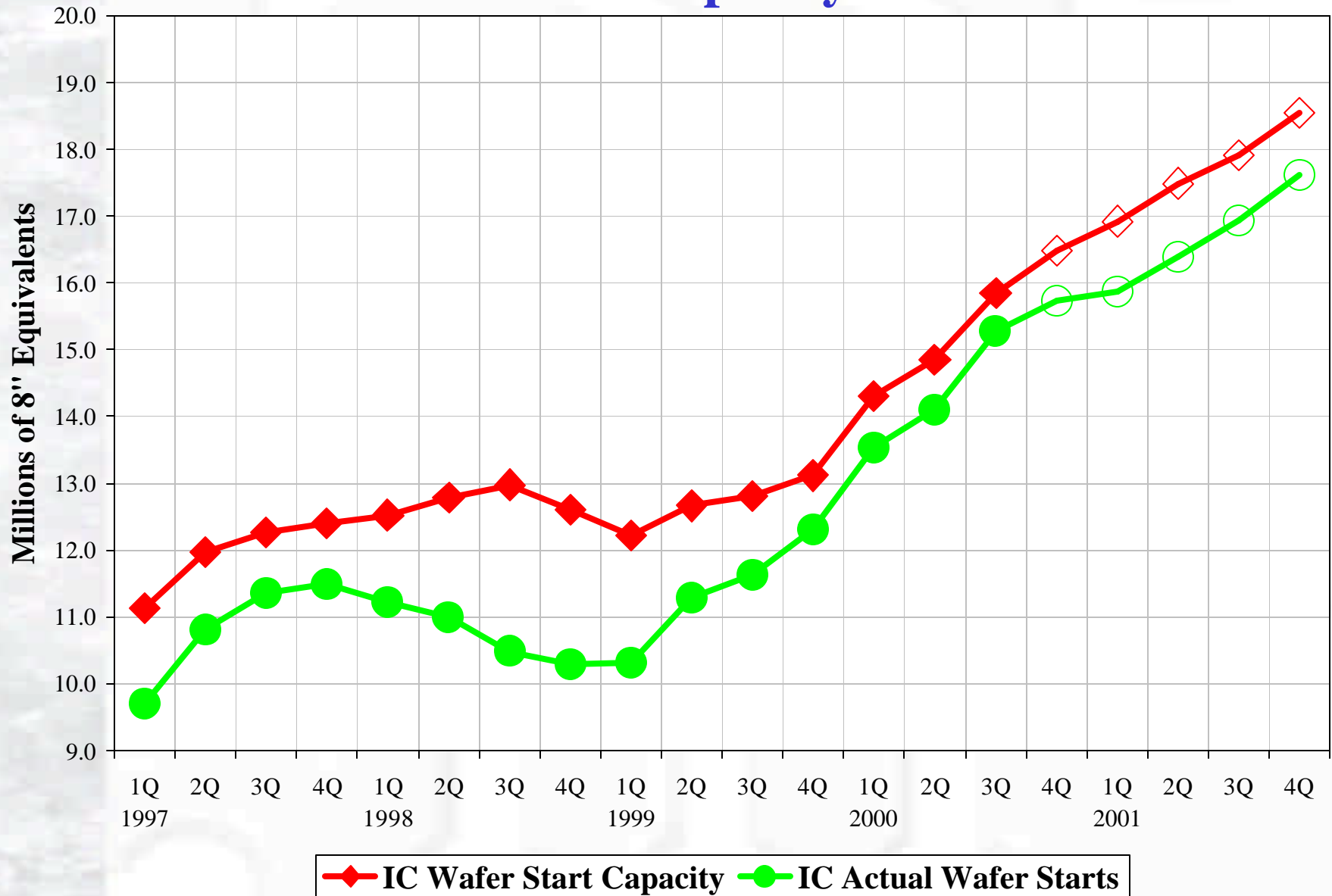
# Capacity & Utilization

- Since Q2 99:
- IC wafer start capacity increased 35.2%
- IC wafer starts increased 47.8%
- Utilization increased from 89.1% to 97.4%
- IC dollar shipments increased 69.4%
- IC unit shipments increased 47.4%
- IC AASP increased 15.0%

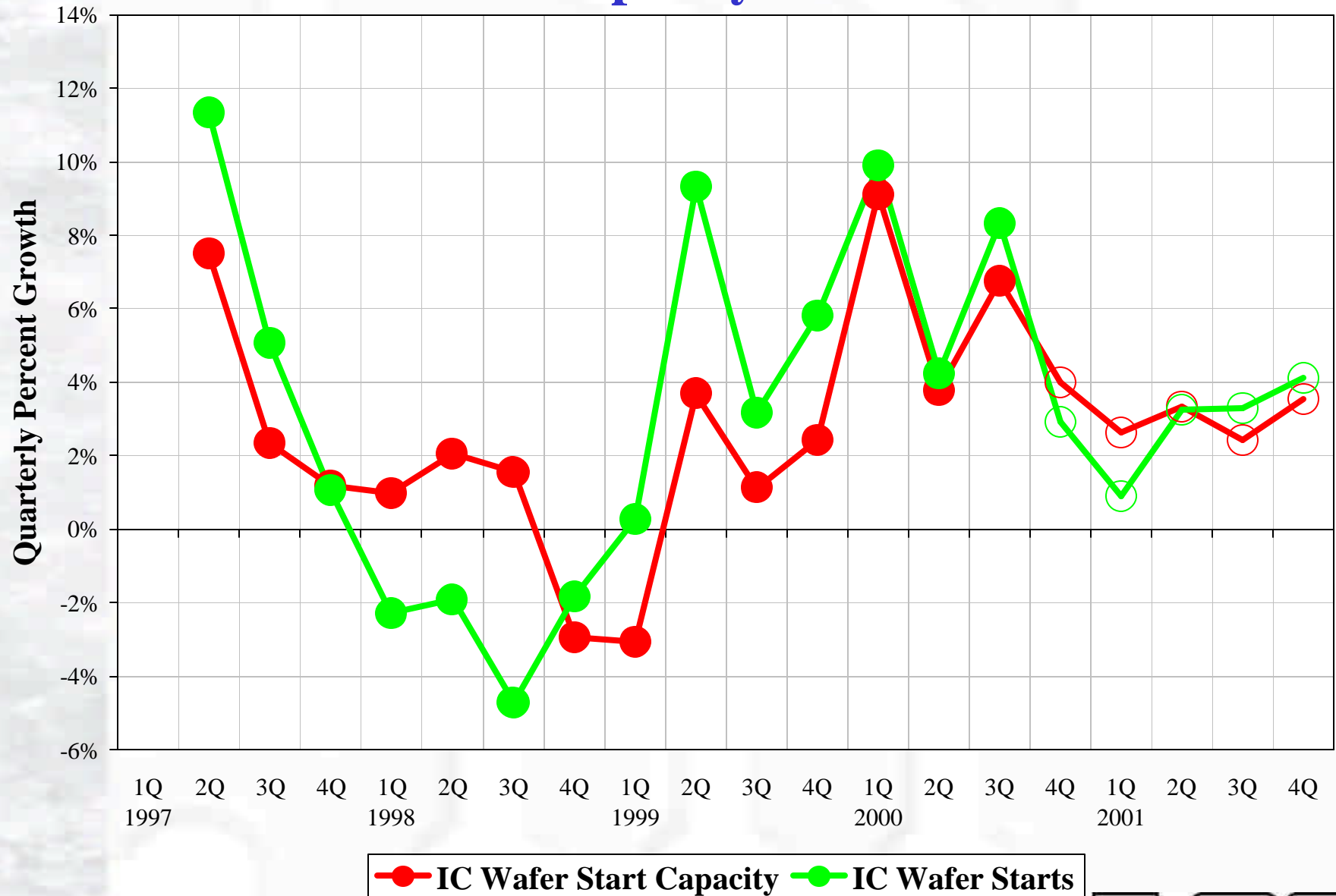
# Capacity & Utilization

- Q4 2000 IC shipments turned down while capacity increased:
- IC Capacity up 4.0%
- IC Utilization up 2.9%
- IC Dollars down 4.6%
- IC Units down 2.8%
- IC AASP down 1.9%

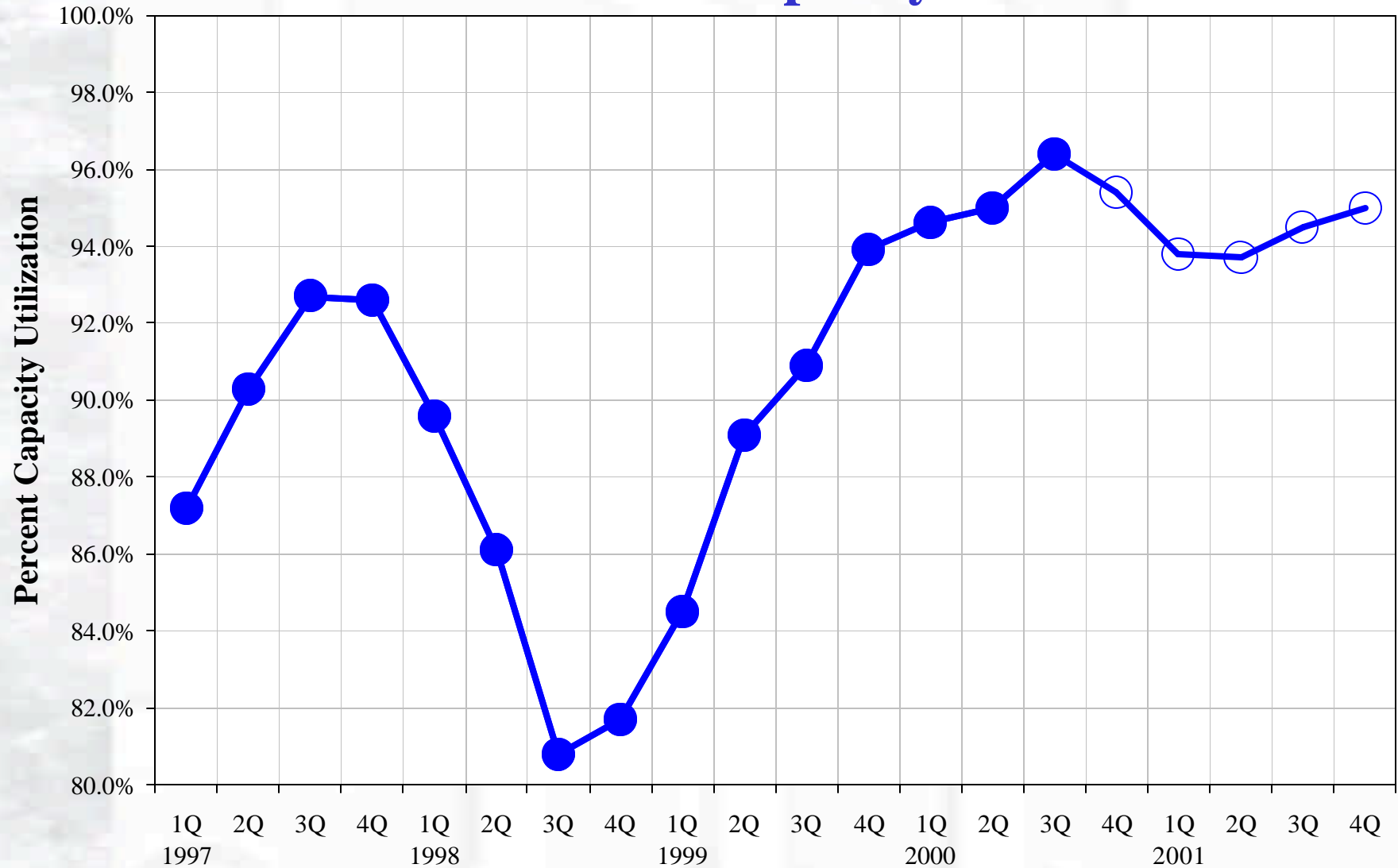
# IC Wafer Start Capacity & Utilization



# IC Wafer Start Capacity & Utilization Growth

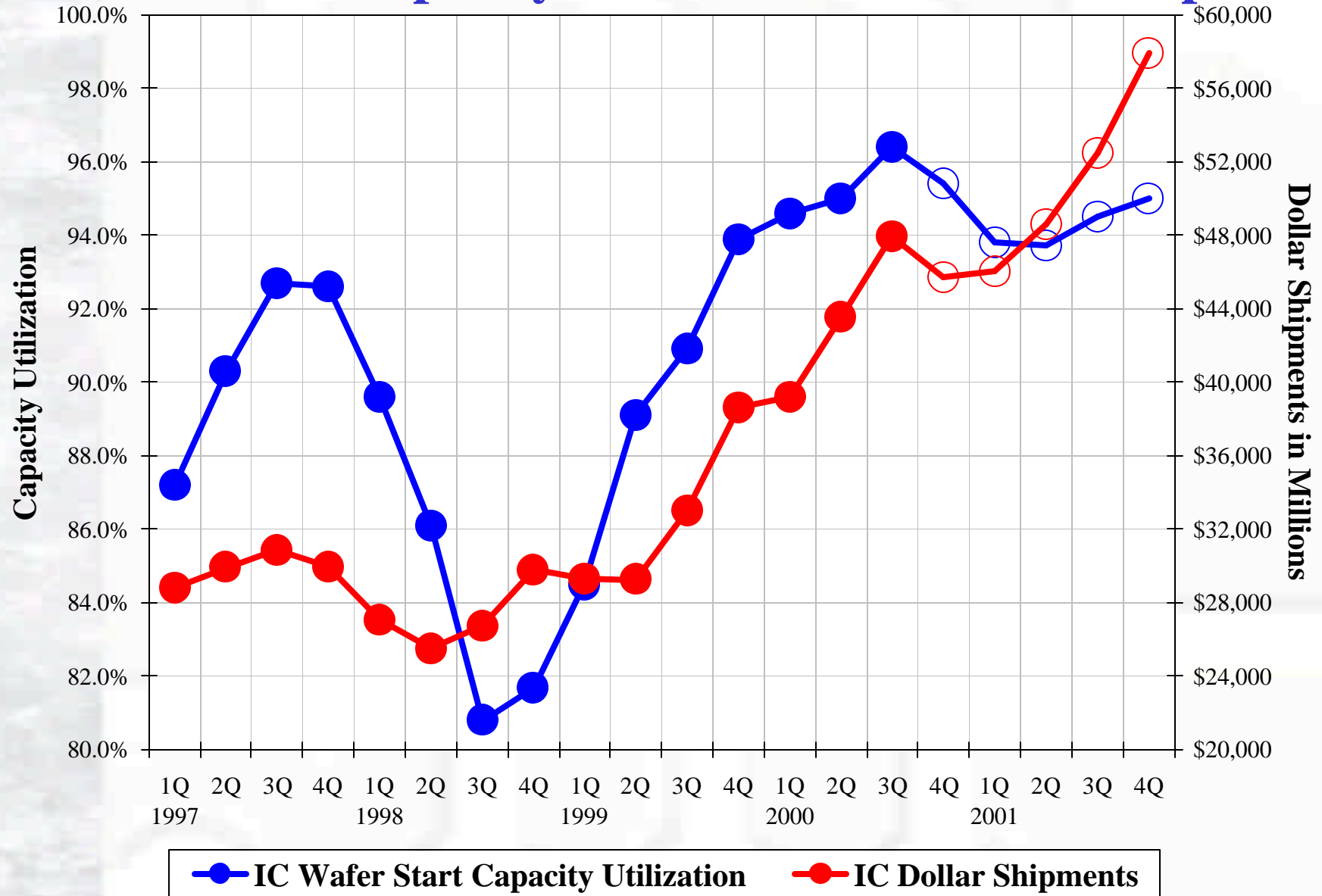


# IC Wafer Start Capacity Utilization

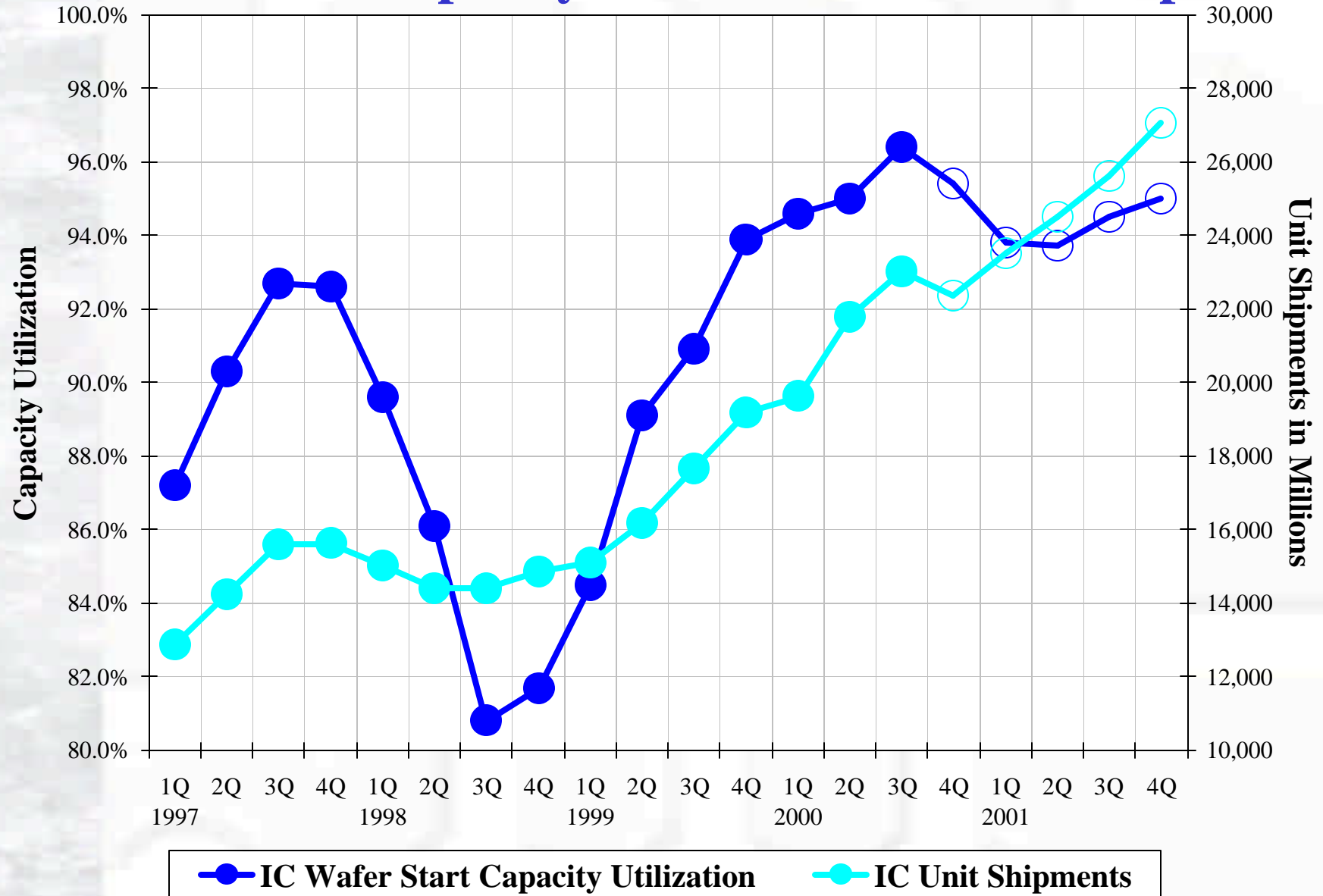


—●— IC Wafer Start Capacity Utilization

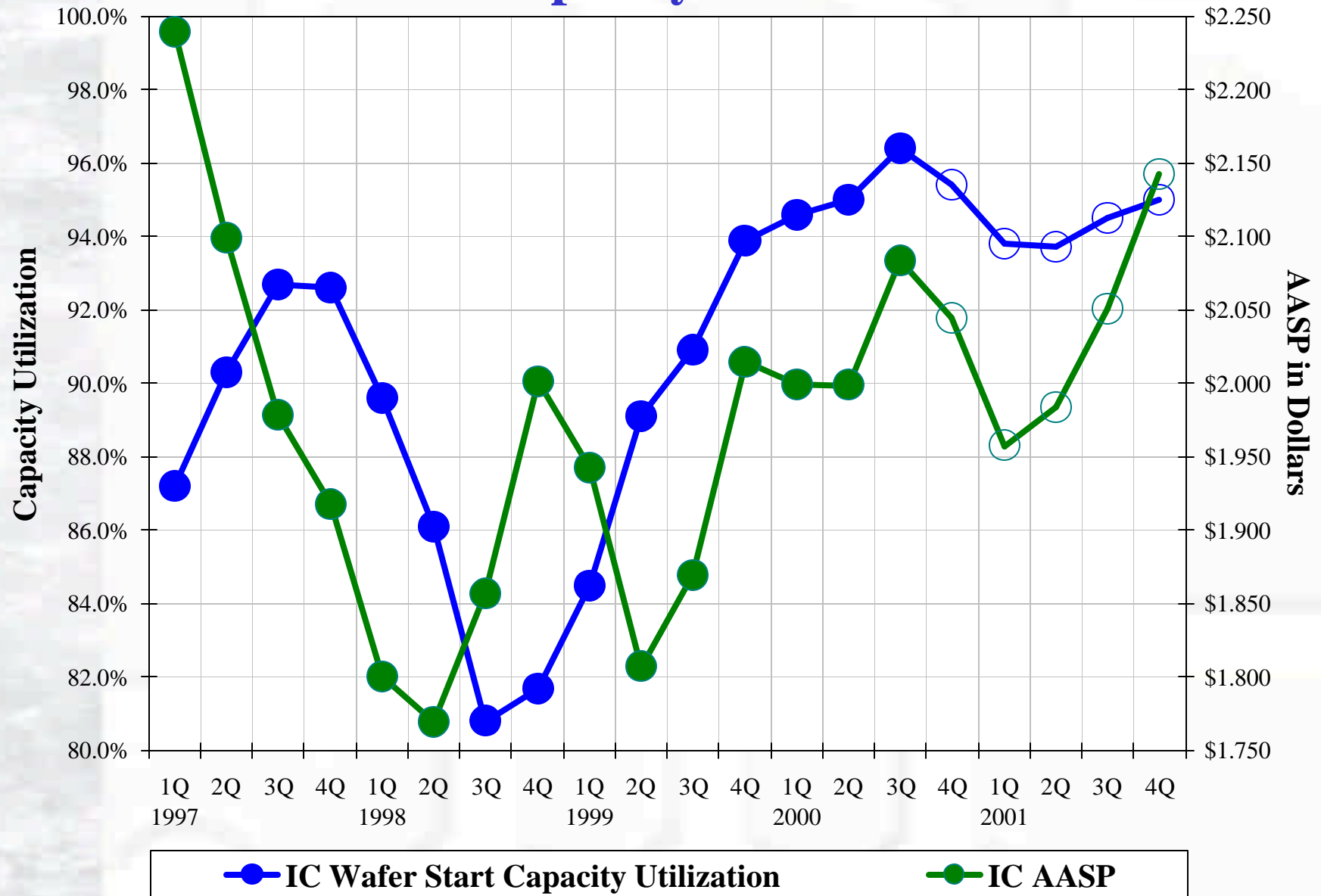
# IC Wafer Start Capacity Utilization Vs. Dollar Shipments



# IC Wafer Start Capacity Utilization Vs. Unit Shipments



# IC Wafer Start Capacity Utilization Vs. AASP





# Economic Conditions

- The IMF forecast (prior to the Fed dropping interest rate) that the U.S. and other semiconductor consuming countries' GDP growth will slow in 2001
- Inflation appears to be under control
- The Fed moves to derail a possible recession in the U.S.

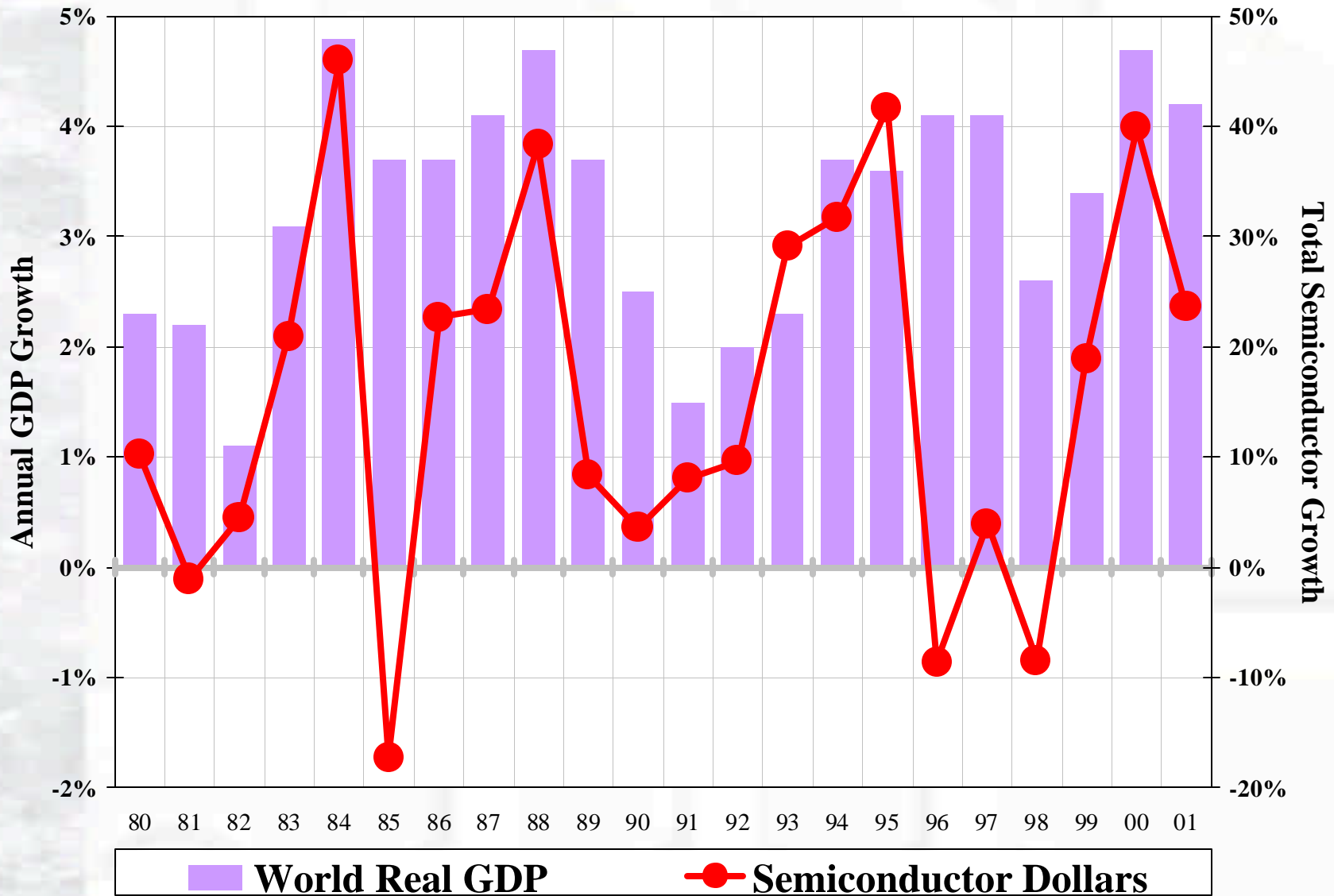
# Country Annual GDP Growth

GDP Growth	1996	1997	1998	1999	2000	2001
United States	3.4	3.9	4.4	4.2	5.2	3.2
Canada	1.2	4.0	3.3	4.5	4.7	2.8
Germany	1.3	1.8	2.1	1.6	2.9	3.3
France	1.6	2.3	3.2	2.9	3.5	3.5
United Kingdom	2.2	3.5	2.6	2.1	3.1	2.8
Italy	1.1	1.8	1.5	1.4	3.1	3.0
Japan	3.9	1.4	-2.5	0.2	1.4	1.8
Korea	7.1	5.0	-6.7	10.7	8.8	6.5
Taiwan	5.7	6.8	4.7	5.7	6.5	6.0
Hong Kong	4.6	5.3	-5.1	2.9	8.0	4.8
Singapore	6.9	9.0	0.4	5.4	7.9	5.9
China	9.6	8.8	7.8	7.1	7.5	7.3
India	7.5	5.5	6.3	6.4	6.7	6.5
Indonesia	8.0	4.7	-13.0	0.3	4.0	5.0
Malaysia	8.6	7.7	-7.4	5.6	6.0	6.0
Philippines	5.7	5.2	-0.6	3.3	4.0	4.5
Thailand	5.5	-1.3	-10.2	4.2	5.0	5.0

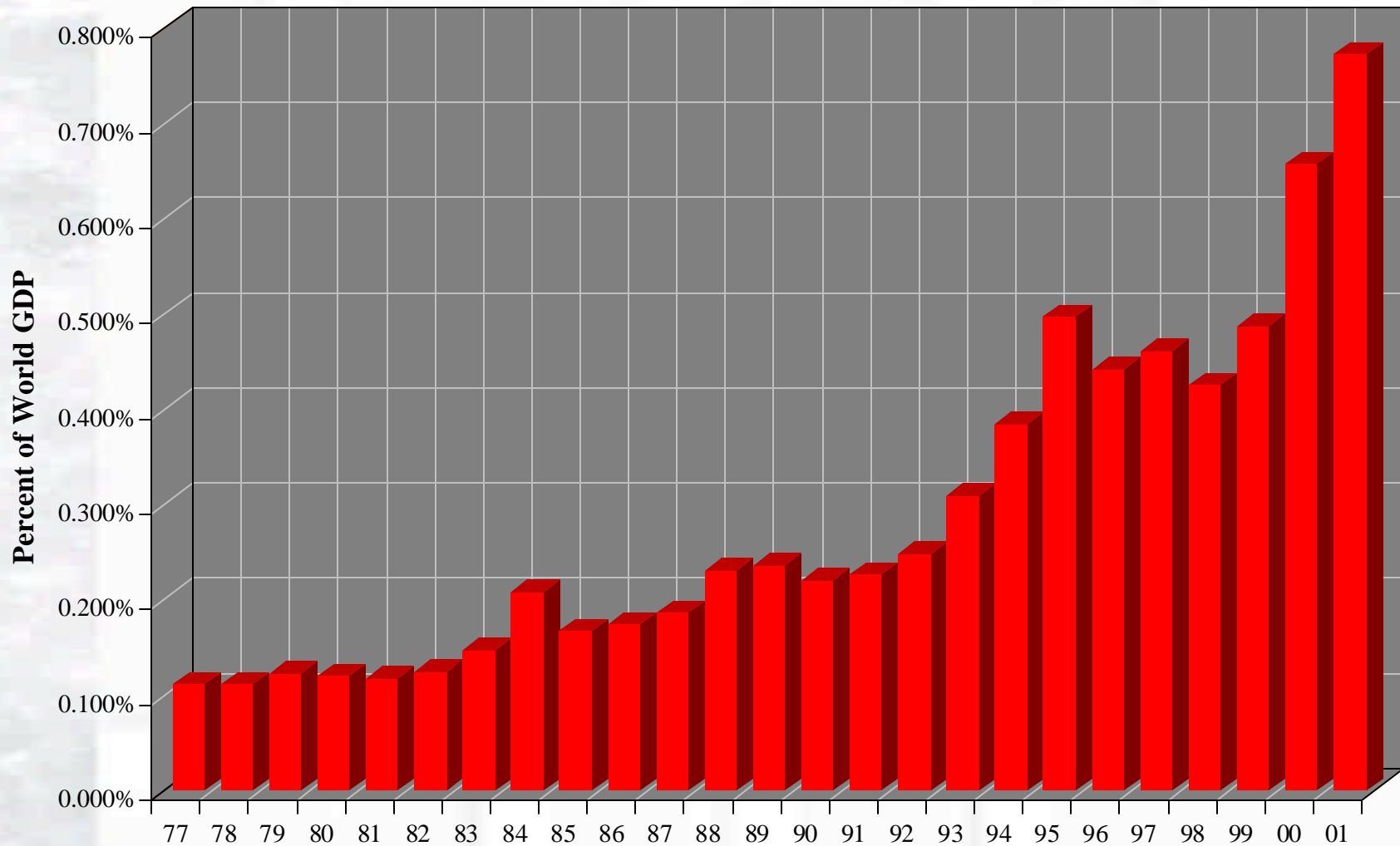
# Country GDP in U.S. Dollars

Country - 2001 IMF Forecast	GDP \$B	% of Total
CANADA	\$727	2.2%
CHINA,P.R.: MAINLAND	\$1,163	3.6%
CHINA,P.R.:HONG KONG	\$175	0.5%
FRANCE	\$1,359	4.2%
GERMANY	\$1,992	6.1%
INDIA	\$517	1.6%
INDONESIA	\$187	0.6%
IRELAND	\$105	0.3%
ISRAEL	\$111	0.3%
ITALY	\$1,119	3.4%
JAPAN	\$4,787	14.7%
KOREA	\$519	1.6%
MALAYSIA	\$98	0.3%
PHILIPPINES	\$84	0.3%
SINGAPORE	\$104	0.3%
TAIWAN PROV.OF CHINA	\$360	1.1%
THAILAND	\$142	0.4%
UNITED KINGDOM	\$1,467	4.5%
UNITED STATES	\$10,554	32.5%
Sub Total	\$25,568	78.7%
World GDP at market exchange rates	\$32,480	100.0%

## Annual % Change: World Real GDP & Semiconductor Dollars

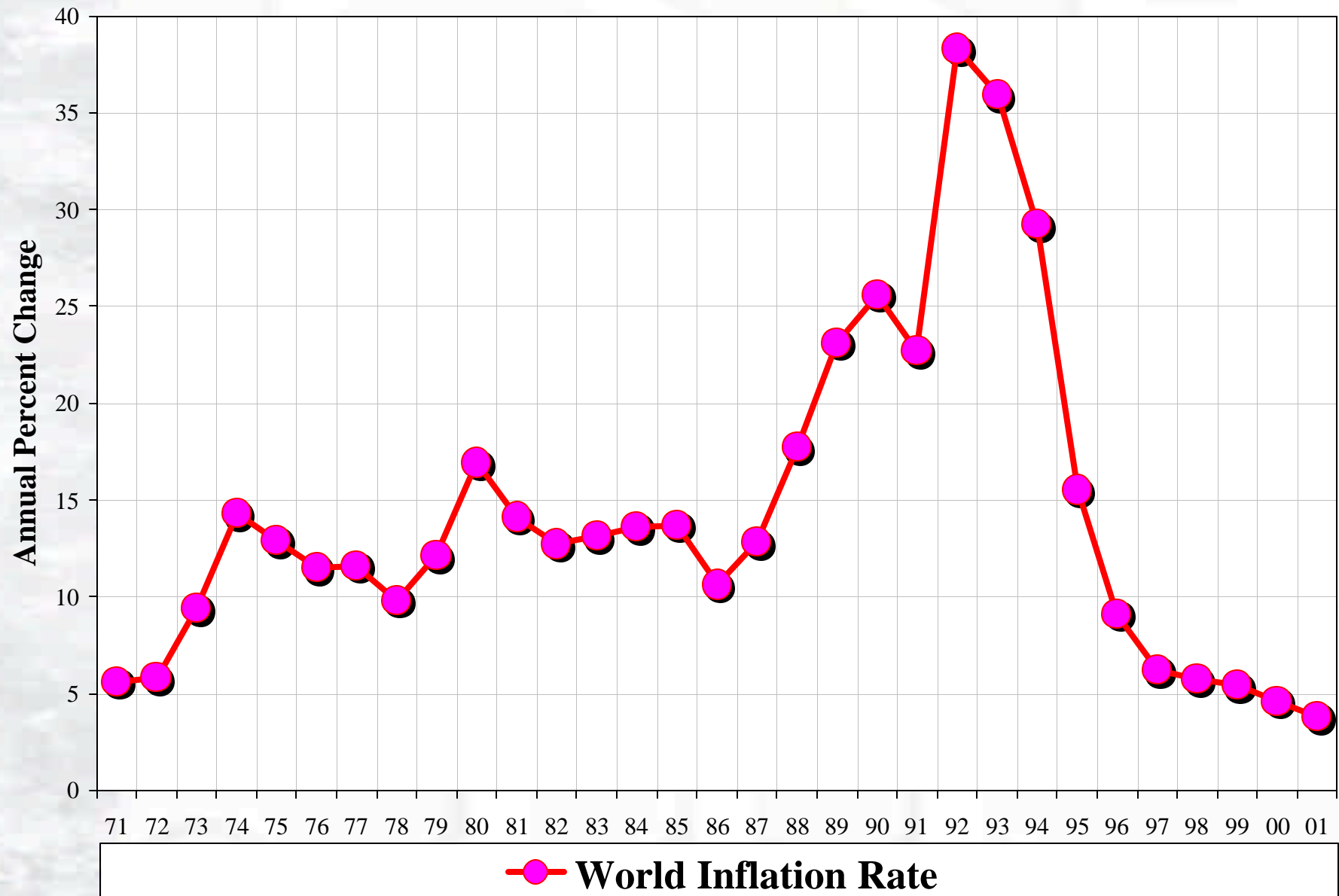


# Semiconductor Dollar Shipments Percent of World GDP

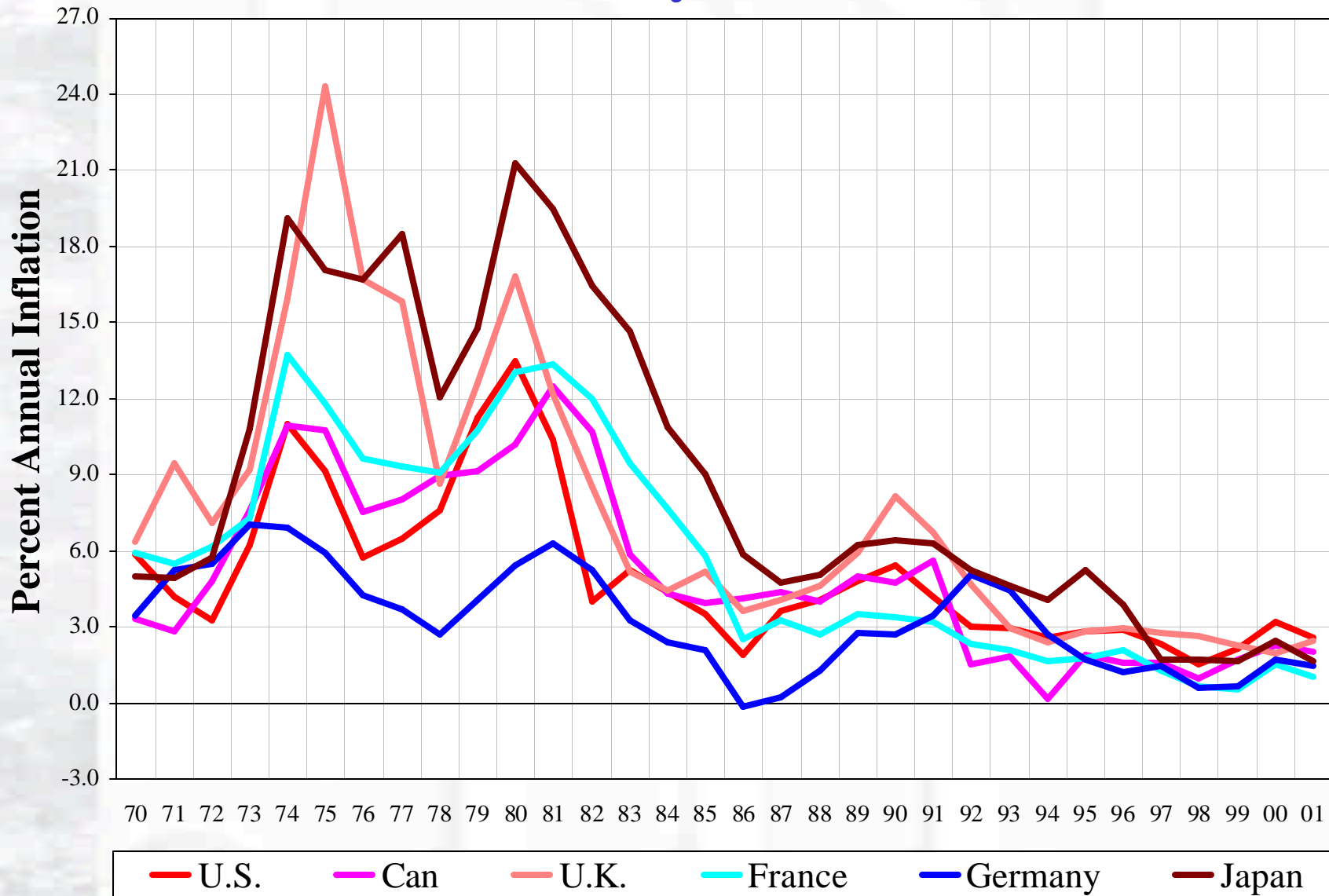


■ World Semiconductor Dollar Shipments % of GDP

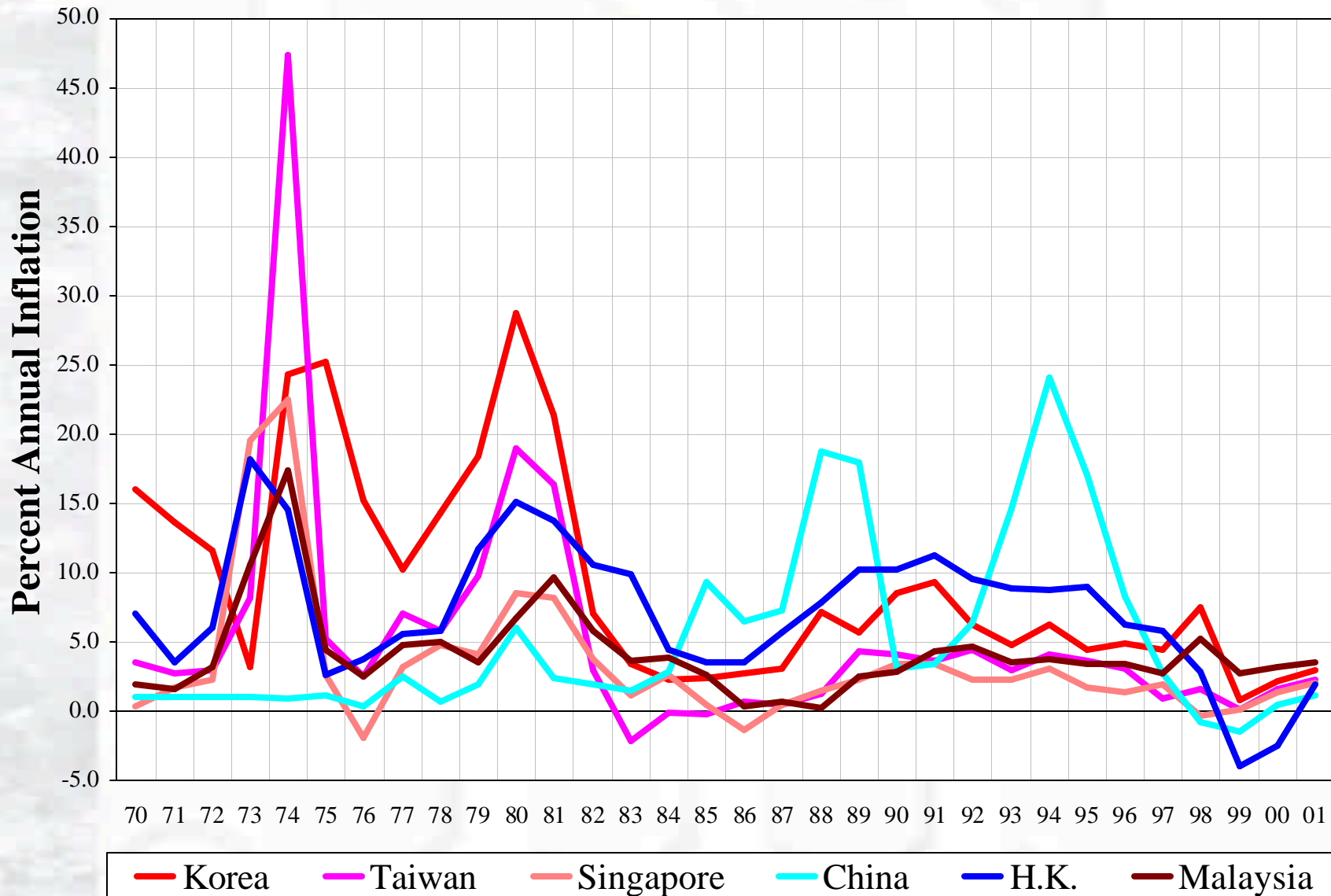
# World Inflation Rate



# Selected Country Inflation Rates



# Selected Country Inflation Rates

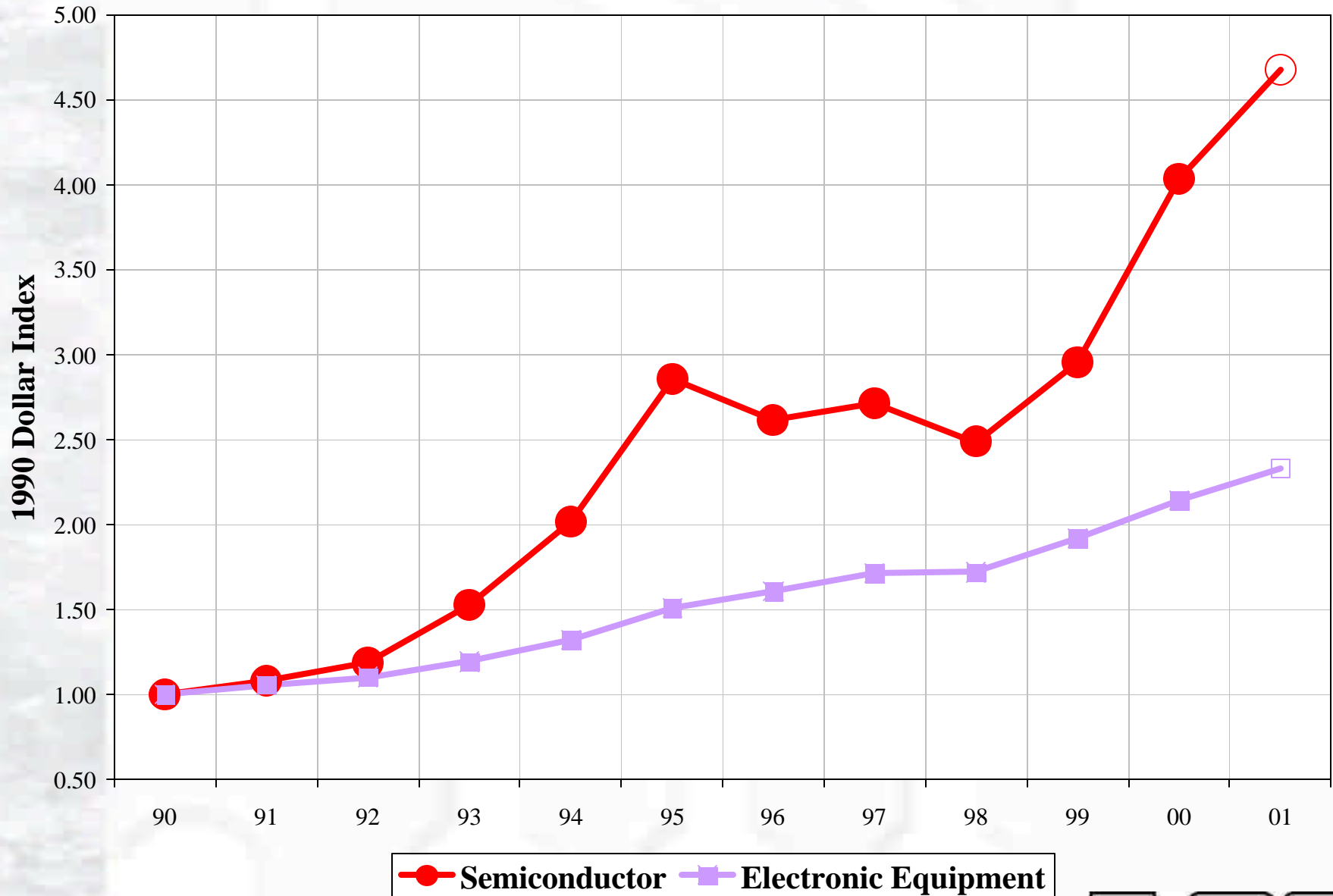




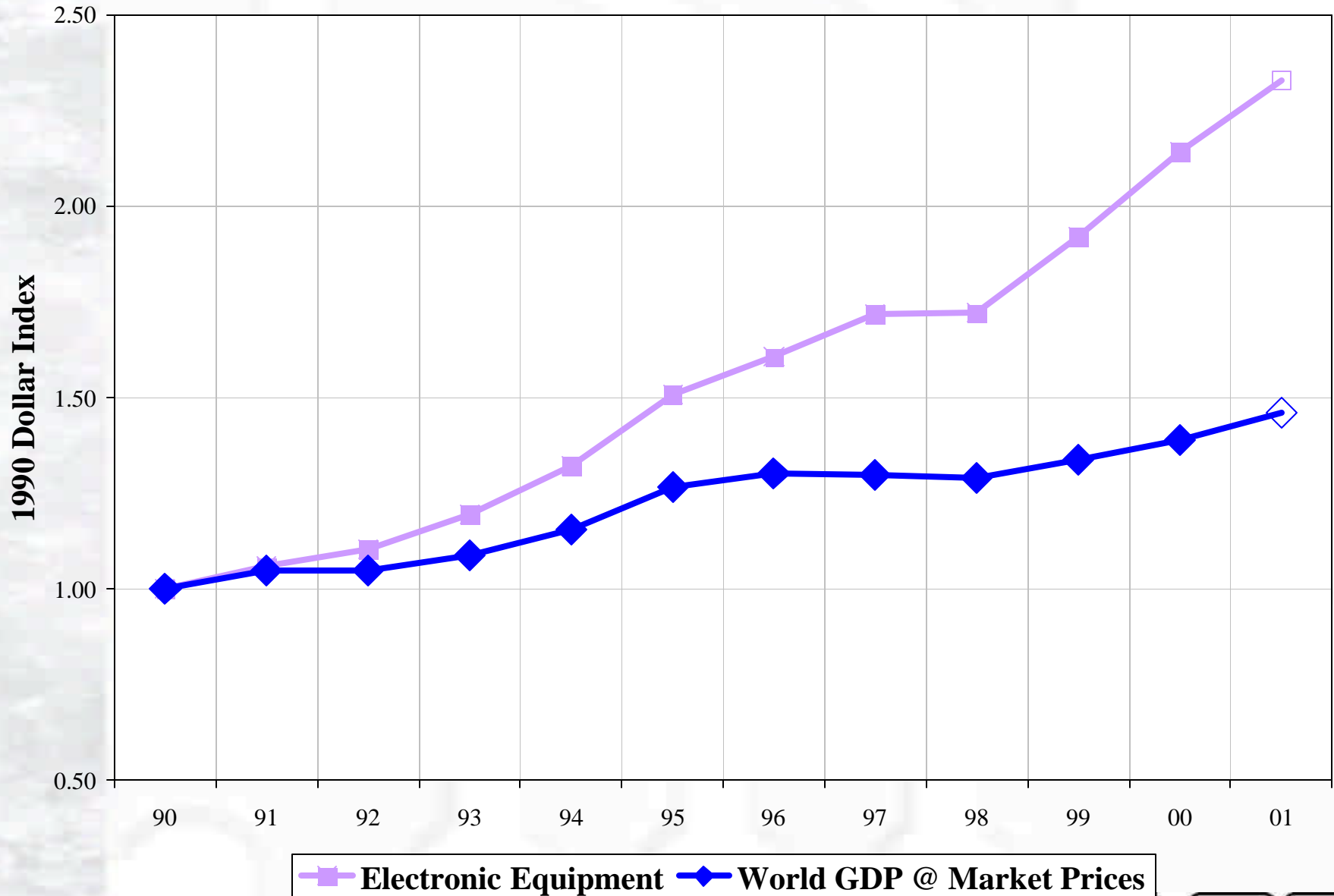
# Electronic Equipment

- 2001 growth is expected to be moderate
  - Communications systems still strong
  - Cell phones (Toys) moderate
  - PC moderate
    - Megabits per PC to increase as DRAM prices come down

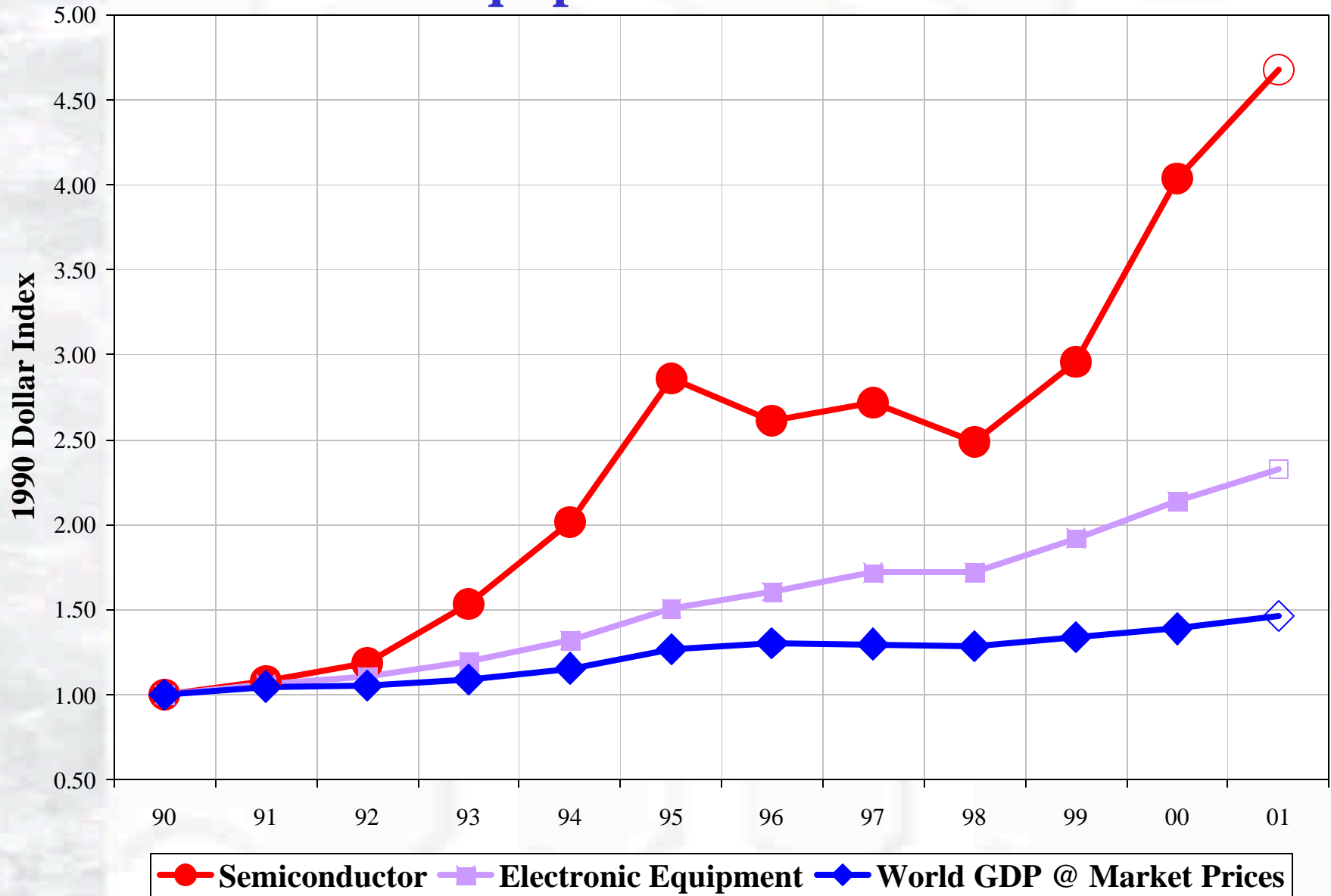
# Semiconductor & Electronic Equipment 1990 Dollar Index



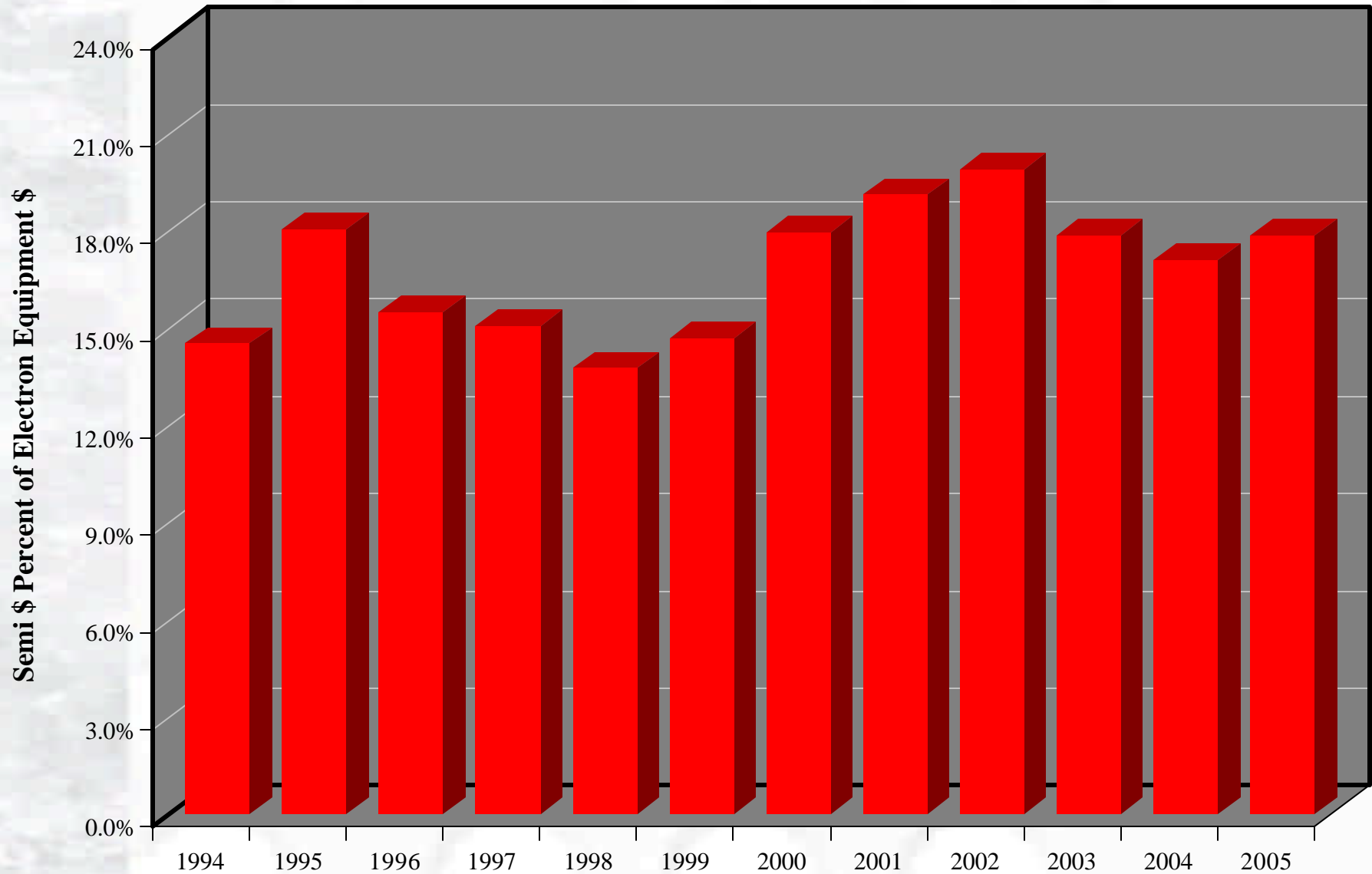
# World GDP & Electronic Equipment 1990 Dollar Index



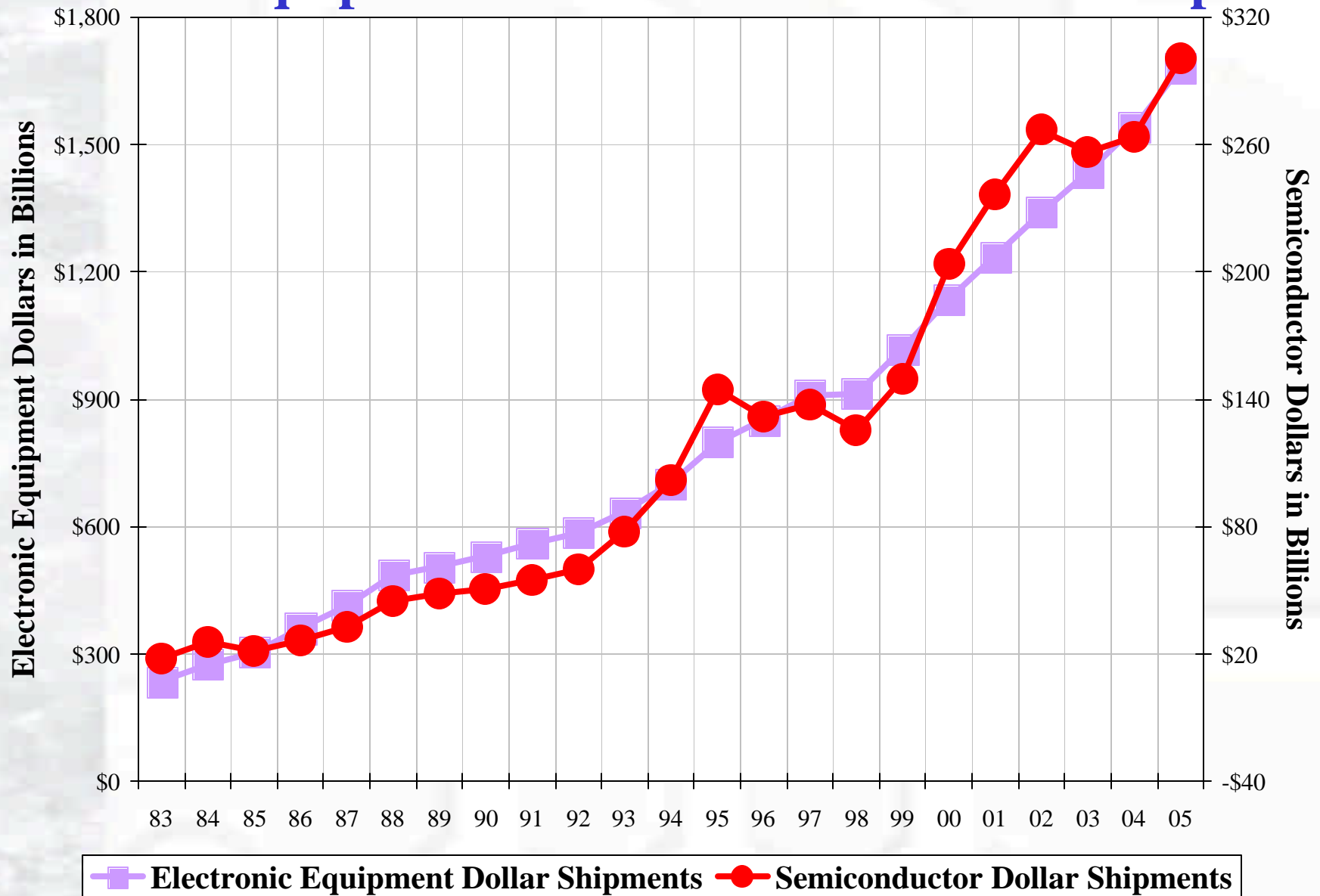
# GDP & Electronic Equipment & Semi 1990 Dollar Index



## Semiconductor % of Electronic Systems Dollars



# Electronic Equipment & Semiconductor Dollar Shipments



# Summary 2001 Position

- Capacity close to balance with demand
- Electronic Equipment market still alive
- Economic conditions still positive
- Moderate Semiconductor growth likely